REMARKS

With this amendment, Claims 1-3 and 8-26 are pending in the present application. Applicant has canceled Claims 4-7, and added Claims 22-26. In view of these amendments and the following remarks, Applicant respectfully submits that all of the claims of the above-identified application are in condition for allowance.

Claim Rejection – 35 U.S.C. § 102

The Examiner has rejected Claims 1-20 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,425,986 to Guyette.

The Examiner asserts that Guyette discloses each and every limitation claimed in Claims 1-20. Applicant respectfully disagrees. As discussed during the Interview, Guyette does not disclose, *inter alia*, a building material having a stress-relieving elastomer that acts as a stress relaxer between two layers--a cementitious substrate and a resin-impregnated paper--and allows for movement between those layers.

Guyette discloses an optional adhesive between two layers. Guyette 6:15-16 ("The adhesive layers **20**, **21**, when present, may be comprised of any suitable adhesive."). That adhesive, however, is not described as being elastomeric. In fact, the adhesives of Guyette, including isocyanate/urethane and epoxy, are not contemplated as being elastomeric; rather they are contemplated as being used as rigid adhesives. Specifically, Guyette describes that these adhesives are intended to be subjected to heat and pressure with the entire assembly "until consolidated into a ***unitary laminate structure***." Guyette at 7:22-24 (emphasis added).

Elastomers, by contrast, are defined by their "very large deformability with essentially complete recoverability." Exhibit A at 3. As described in Exhibit A, elastomers are often included in the category of "thermoset" polymers, which have a network structure generated or "set" by thermally-induced cross-linking reactions. *Id.* at 4. More particularly, thermosets often refer to networks that are very heavily cross-linked and are below their glass transition temperatures. *Id.* However, all thermosets are not elastomers, and in particular, materials such as phenol-formaldehyde and the epoxy resins "are very hard materials with none of the high extensibility associated with typical elastomers." *Id.* Similarly, many isocyanate/urethane adhesives are rigid adhesives, and would not inherently have elastomeric properties.

Accordingly, Applicant submits that the mere disclosure of adhesives such as isocyanate/urethane and epoxy in Guyette would not necessarily suggest to one of skill in the art an elastomeric adhesive. In fact, in the context of describing the resins used to impregnate the paper sheets, Guyette itself recognizes the desirability of having hard thermosets. Guyette at 5:26-28 ("In the presence of catalysts, and generally of heat, the resins will cure to form a hard thermoset."). If anything, Guyette teaches away from using elastomers instead of rigid adhesives because Guyette seeks to create a "high pressure" unitary laminate structure. See Guyette at 1:44-46; 7:22-24. In other words, Guyette does not want to use an adhesive that could stretch under pressure or under service loads, but rather, wants to create a strong, permanent rock-like bond.

Moreover, there is nothing in Guyette that suggests a need to engineer or even use an elastomeric adhesive. The laminate structure in Guyette is used for indoor applications, such as indoor floor coverings, countertops, or tabletops. Guyette at 1:53-62. Indoor environments do not encounter the same degree of variability in temperature and humidity as outdoor environments. Indeed, the variability of indoor environments is negligible as compared to outdoor environments. In contrast, outdoor environments encounter extreme conditions of heat/cold and moisture/dryness. Because of the relatively stable and constant conditions of indoor environments, one of skill in the art would not be concerned with the impact of extreme conditions when designing an indoor laminate. For instance, one of ordinary skill in the art would not be concerned with differential movement between the paper layer and the cementitious layer—an effect of extreme weather conditions. Indeed, to address a non-issue such as that would add unnecessary cost and expense in designing and manufacturing indoor laminates. As a result, however, Applicant has found that indoor laminate structures delaminate when exposed to extreme variations in humidity and temperature common in outdoor environments. Specification at [33]. Because there is no reason for balancing movement between layers in an indoor environment, the indoor laminate structure of Guyette would not be designed to accommodate for differential movement between layers.

Applicant submits that the adhesives disclosed in Guyette are not inherently elastomeric. One of skill in the art would not contemplate using an elastomeric adhesive based on the teachings or suggestions of Guyette. In fact, because Guyette is concerned primarily with

forming a rigid bond for indoor applications, nowhere does Guyette appreciate the need for a stress-relieving elastomer as in Applicant's claimed invention, which can be used for both indoor ***and*** outdoor applications. Accordingly, Applicant respectfully requests the Examiner to withdraw this rejection.

Applicant also requests the Examiner to withdraw the rejection of the claims that depend on Claims 1 and 17. Claims 2, 3, 8-16 and 18-20 recite a unique combination of features that are not disclosed, taught, or suggested by the cited reference. Accordingly, those claims are allowable.

Claim Rejection – 35 U.S.C. § 103

The Examiner has rejected Claims 17 and 21 under 35 U.S.C. § 103(a) as being unpatentable in view of Guyette.

The Examiner asserts that Guyette teaches each and every limitation of the invention recited in Claims 17 and 21 with the exception of the thickness of the film. The Examiner, however, states that the thickness of the elastomeric film is an optimizable feature because the elastomeric film affects the flexibility of the film. Applicant respectfully disagrees with the Examiner's assessment. One of ordinary skill in the art would not have created a film having the claimed thickness in view of Guyette. There is simply no motivation, in view of Guyette, to optimize a film with that thickness. Moreover, Guyette does not disclose, teach, or suggest the claimed elastomeric film, as discussed above. Accordingly, Applicant respectfully requests the Examiner to withdraw the rejection with respect to Claims 17 and 21.

New Claims

Applicant has added new Claims 22-26.

Claim 22 is similar to Claim 1 but further recites an elastomer that has an elongation between about 20% and 1200%, a modulus of elasticity at 100% elongation of between about 10 and 10,000 psi, and a glass transition temperature between about –90 and 50°C. The available art does not disclose the unique combination of features recited in Claim 22. Accordingly, Applicant respectfully submits that Claim 22 is in condition for allowance.

Claim 23 is similar to Claim 1 but further recites an elastomer having an elongation between about 20% and 1200%. The available art does not disclose the unique combination of features recited in Claim 23. Moreover, Guyette does not provide any suggestion or teaching that

its adhesive has any elongation properties, let alone the range recited in Claim 23. Accordingly, Applicant respectfully submits that Claim 23 is in condition for allowance.

Claim 25 is similar to Claim 1 but further recites an elastomer having a modulus of elasticity at 100% elongation of between about 10 and 10,000 psi. The available art does not disclose the unique combination of features recited in Claim 25. Moreover, Guyette does not provide any suggestion or teaching that its adhesive is capable of maintaining a modulus of elasticity between the range of pressures that is recited in Claim 25. Accordingly, Applicant respectfully submits that Claim 25 is in condition for allowance.

Applicant also submits that the claims that depend on Claims 23 and 25 are in condition for allowance. Claims 24 and 26 recite a unique combination of features that are not disclosed, taught, or suggested by the available art. Accordingly, the claims are allowable.

CONCLUSION

In view of the amendments and the foregoing remarks, Applicant submits that this application, as amended, is in condition for allowance and such action is respectfully requested. If any issues remain or require further clarification, the Examiner is respectfully requested to call Applicant's counsel at the number indicated below in order to resolve such issues promptly. Also, if there are any additional fees, including any fees for additional extensions of time, or credit overpayment, please charge it to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 11-9-05

By:

Sabing H. Lee
Registration No. 43,745
Patent Attorney of Record
Customer No. 20,995
(949) 760-0404

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Clara D. Craver and Charles E. Carraher, Jr.

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THERMOSET ELASTOMERS

J. E. MARK

Department of Chemistry and the Polymer Research Center
University of Cincinnati, Cincinnati, Ohio 45221-0172

Introduction

Basic Concepts. Elastomers are defined by their very large deformability with essentially complete recoverability. In order for a material to exhibit this type of elasticity, three molecular requirements must be met: (i) the material must consist of polymeric chains, (ii) the chains must have a high degree of flexibility and mobility, and (iii) the chains must be joined into a network structure (1-3).

The first requirement arises from the fact that the molecules in a rubber or elastomeric material must be able to alter their arrangements and extensions in space dramatically in response to an imposed stress, and only a long-chain molecule has the required very large number of spatial arrangements of very different extensions. The second characteristic required for rubberlike elasticity specifies that the different spatial arrangements be *accessible*, i. e., changes in these arrangements should not be hindered by constraints as might result from inherent rigidity of the chains, extensive chain crystallization, or the very high viscosity characteristic of the glassy state (1,2,4,5-8). The last characteristic cited is required in order to obtain the elastomeric recoverability. It is obtained by joining together or "cross linking" pairs of segments, approximately one out of a hundred, thereby preventing stretched polymer chains from irreversibly sliding by one another. The network structure thus obtained is illustrated in Figure 1, in which the cross links are generally chemical bonds (as would occur in

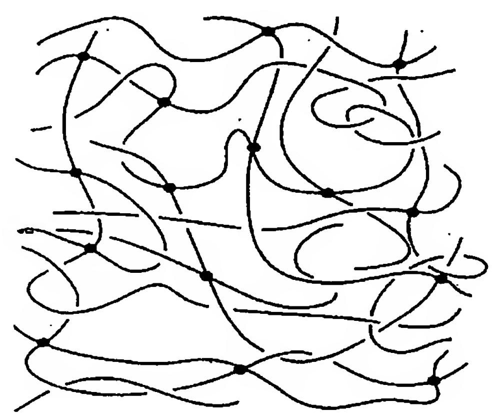

Figure 1. Sketch of a typical elastomeric network, with an interchain entanglement depicted in the lower right-hand corner.

sulfur-vulcanized natural rubber). These elastomers are frequently included in the category of "thermosets", which are polymers having a network structure which is generated or "set" by thermally-induced chemical cross-linking reactions. The term has now frequently taken on the more specific meaning of networks that are very heavily cross linked and below their glass transition temperatures. Such materials, exemplified by the phenol-formaldehyde and the epoxy resins, are very hard materials with none of the high extensibility associated with typical elastomers.

The cross links in an elastomeric network can also be temporary or physical aggregates, for example the small crystallites in a partially crystalline polymer or the glassy domains in a multi-phase triblock copolymer (3,6). The latter materials are considered separately in the chapter on "Thermoplastic Elastomers". Additional information on the cross linking of chains is given below.